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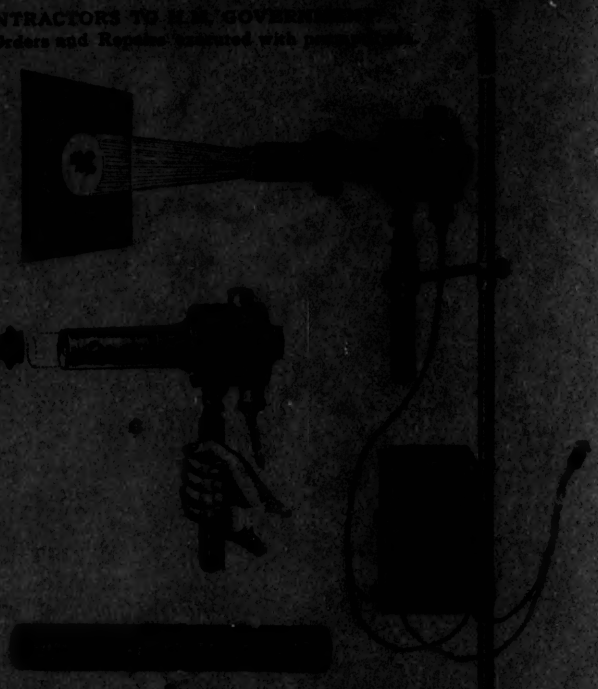

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18.—TURBERVILLE OF SALISBURY

BY

R. R. JAMES

LONDON

I THINK that it will be conceded by those who have studied the rise of ophthalmology in this country, that the eighteenth century *par excellence* was the heyday of ophthalmic quackery. The names of Sir William Read, of Roger Grant, and of the Chevalier Taylor will occur to all; the first two, unblushing humbugs, with no education of any sort and no medical qualification of any kind; and Taylor, a prince of humbugs, albeit bred a surgeon; no fool, with a good deal of special knowledge, but a charlatan and a pastmaster in the art of self-advertisement.

This paper deals with a man who belongs to an earlier age, the seventeenth century, when medicine generally was only just emerging from the astrological period. It is a remarkable fact that he was not only a properly qualified medical man, but also a member of an ancient English family; records of which go back to the days of King John, if not earlier still; branches of which were settled in various counties. The name would appear to have been adapted by Thomas Hardy in his "Tess of the D'Urbervilles." John Durbeyfield boasting of his ancestors in the church

at Kingsbere in saying: "There's not a man in the county of South-Wessex that's got grander and nobler skillentons in his family than I," is presumably referring to the Turbervilles of Bere Regis in Dorset. Mr. Hardy is in error in making Parson Tringham state that "their names appear in the Pipe rolls in the time of King Stephen," for there is a sad break in the series of these rolls from the last of Henry the First to the second of Henry the Second; and the rolls for Stephen's reign, if they ever existed, are no longer among the Public Records of the Kingdom.

Dawbigney Turberville was a son of George Turberville, gent, of Wayford, County Somerset. In Collinson's History of that county will be found quite a number of early references to the Turberville family; thus, William de Turberville was Sheriff of the county in 1256-57; Sir Richard de Turberville, Sheriff, 1356-57; Sir John de Turberville, Sheriff, 1487; while Henry de Turberville, in the seventeenth of King John, had wardship of Nicholas Fitz-Martin of Chewton; and William de Turberville, in the fifteenth of Henry the Sixth, was holding a third part of the manor of Moreton in the same county. In the forty-seventh of Edward the Third, Cicely Beauchamp of Shepton-Beauchamp married as her second husband, Richard Turberville of Bere Regis, and bore on her seal "checky," the arms of Turberville. In the *Testa de Nevill* the name will be found in connection with the counties of Hereford, Warwick and Leicester, and Berkshire. Dawbigney was of Oriel College, Oxford, matriculating November 7, 1634, aged 19 years. He took his B.A., October 15, 1635; his M.A., July 17, 1640; and his M.D., August 7, 1660[1].

We next hear of him serving as a combatant for the King at the siege of Exeter in 1646. When the city was captured by Fairfax he quitted the military life and settled at Wayford.

The chief account of Dr. Turberville is to be found in Walter Pope's "Life of Seth Ward, Bishop of Salisbury," 1697. In this scarce book a whole chapter (number 16, of Dr. Turbervile) is devoted to our Salisbury oculist, and from it I have abstracted most of what follows in a somewhat abridged form. Turberville cured the writer, Pope, who says: "It was he who twice rescued me from blindness, which without his aid had been unavoidable, when both my eyes were so bad, that with the best I could not perceive a letter in a book, not my hand with the other, and grew worse and worse every day."

Turberville was born in 1612 of an old-English family, "there being in the church of Beer only, the tombs of no less than fifteen Knights of that name, as I have been credibly informed, but I confess I have not seen them." His mother was a Dawbigney, and it was upon her advice, according to Pope, that the son took up the study of eye diseases at the University.

While besieged at Exeter he and a friend ran in debt £100 each, "in chalk behind the door; he told me that his landlord came into their chamber, leading his daughter by the hand, and courteously proffered to cancel the debts of either of us who should marry her." Turberville "valiantly resisted this temptation and chose rather to pay his debts in ready money, which he did shortly after; the other accepted the terms, and had his wife's portion presently paid him, *viz.*, his scores wiped out with a wet dishclout."

The articles allowed the garrison of Exeter to return to their dwellings; he went to Wayford and married, but had no children. He began practice at Wayford and Crookhorn (Crewkerne), but got so busy that he moved to London. The city air not suiting him he finally settled in Salisbury; "thence he made several journeys to London. Once he was sent for by the Dutchess of York to cure the Princess of Denmark (Queen Anne), then a child, labouring under a dangerous inflammation in her eyes, and a breaking out in her face the cure for which had been attempted in vain by the Court fysicians." These despised Turberville, looking on him as a country quack. He had a quarrel with them, refused to meet them in consultation and won the day. The Duke and Duchess asked him to undertake the case, which he did successfully. The Duke ordered him a fee of £600, but he appears to have received only half that amount. "Many years afterwards he was called up again by one of the greatest and ancientest Peers of this Kingdom, to whom, after having attentively inspected his eye, he spoke after this manner: 'My Lord, I might bear you in hand,' a western frase, signifying to delay or keep in expectation, 'and feed you with promises, or at least hopes, that I should cure you in some competent time, and so cause your Lordship to be at great expence to no purpose; I cannot cure you, and I believe no man in England can.' The Earl answered, 'Such and such will undertake it for a hundred pounds.' To which the doctor replied, 'I have so great an honour for your Lordship, and so much wish for your welfare, that I will joyfully give a hundred guineas out of my own purse to the person who shall restore your sight in that eye. I confess I am not able to cure it, but I can reduce it to a better figure.'"

Turberville was no boaster, "he generally prescribed to all, shaving their heads and taking tobacco, which he had often known to do much good, and never any harm to the eyes. Far from covetous, he cured the poor gratis, and received from others what they pleased to give him, never, that I knew, making any bargain for so much in hand, and the rest when the cure is perfected, as some do." Pope could never force anything on him for his medicines and extraordinary care, unless it were a cane, a tobacco-box or some new book. "He has cured several who were born

blind, but I do not look upon that as so great a thing; for the cure of such, if curable, for there are several sorts of cataracts uncurable, consists wholly in this, *viz.*, in knowing when the connate cataract is fit to be couched, in having a steady hand, and skill to perform that operation, to be able to prevent, or at least, remove the pains which usually follow, and sometimes kill the patient; but to reduce fallen and inverted eyelids to their proper place and tone, to cure inveterate ulcers, and inflammations of a blackish colour, requires a consummate artist. *Hic labor, hoc opus est.*"

Patients came from all over the country and even from abroad; one is mentioned from Jamacia; she was cured but died of small-pox before she could return to her home. It was good business for the City of Salisbury; his patients "being lodged in inns and private houses through all quarters of the city: one could scarce peep out of doors, but have a prospect of some led by boys or women, others with bandages over one or both eyes, and yet a greater number wearing green silk upon their faces, a stranger might have reported the air of Salisbury to be as pernicious to the eyes as that of Orleans is to the nerves, where almost one-third of the inhabitants are lame."

Tales of two patients are next related. In one, a countryman with a bloodshot eye consulted Turberville, who, after inspection, told the man that the inflamed eye was the best of the two. The man vowed that he could see equally well with either eye, but on the inflamed eye being covered, found that he could see nothing with the other and exclaimed: "I am blind in it, tho' to all the rest who were there, it seemed a good eye." In the second case, a man came with a protuberant eye, which could not be contained within the lids and seemed to be like a piece of raw flesh. Dr. Turberville "placed him in a chair and with a pair of scissors cut large gobbetts, the blood trickling down his cheeks in abundance, and yet he seemed no more concerned, than if it had been a barber cutting his hair. I was surprised at his behaviour and said to one of the bystanders, 'without doubt this is a married man otherwise 'twere impossible he should be so patient'; which he overhearing in the midst of his torment burst into a loud laughter, and replied, 'No indeed, I am but a batchelor.'"

Dr. Turberville left his estate between a niece of his wife's and his sister Mary Turberville, "who now practises in London with good reputation and success. She has all her brother's receipts, and having seen his practice during many years knows how to use them. For my part I have so good an opinion of her skill that should I again be afflicted with sore eyes, which God forbid, I would rely upon her advice rather than upon any pretenders or professors in London or elsewhere."

Lest any should be surprised at Mary Turberville taking on the practice I may remind readers that Sir William Read's widow carried on his business after his death at Durham Yard, Strand.[2] Pope's chapter ends as follows:

> *Adieu my dear friend, a rivederci, till we meet and see one another again with eyes which will never stand in need of a* COLLYRIUM. Appended is the following epitaph:

M.S.

Near this place, lies interred the most expert and successful oculist that ever was, perhaps that ever will be,

DR. DAWBIGNEY TURBERVILLE.

Descended from two families of those names, than which there are few more ancient and noble. During the Civil War he bore arms for the King. After the surrender of Exeter he lived at Wayford and Crookhorn; but those towns not affording conveniences to his numerous patients he removed to London, intending to settle there, but not having his health he left it and lived in Salisbury more than 30 years, doing good to all, and being beloved by all. His great fame caused multitudes to flock to him, not only from all parts of this Kingdom, but also from Scotland, Ireland, France, and America. He died April 21st, 1696, in the 85th year of his age. And left his estate betwixt his only sister and niece, at whose expenses this monument was erected.

Doctor Walter Pope wrote this epitaf to perpetuate his gratitude, and the memory of his friend and benefactor.

The Philosophical Transactions

In the fourteenth volume of the *Philosophical Transactions*, page 81, will be found two letters from that experienced oculist, Dr. Turberville of Salisbury to Mr. William Musgrave, S.P.S., of Oxon, containing several remarkable cases in physic, relating chiefly to the eyes. The first letter, dated London, August 4,

1684, runs: "The disease which in some late discourse with you I named bursa oculi or the pouch of the eye, was a bag without matter in it, like an empty purse on the white of the eye under the upper lid. It hung flag about the length of a thumb nail. Another person had no visible disease in his eyes, but could not see at all unless he squeezed his nose with his fingers, or saddled it with narrow spectacles, and then saw very well; him I carried to Mr. Boyle as a fit subject for so great a philosopher to make his remarks on.

A maid, 22 or 23 years old, came to me from Banbury, who could see very well but no colour beside black and white. She had such scintillations by night with the appearance of bulls, bears, etc., as terrified her very much; she could see to read sometimes in the greatest darkness for almost a quarter of an hour."

The second letter, dated Sarum, October 5, 1684, runs: "A saddler's daughter of Burford had an imposthume which broke in the corner of one of her eyes, out of which came about thirty stones, splendid, and as large as pearls.

"A person in Salisbury had a piece of iron or steel stuck in the iris of the eye which I endeavoured to push out with a small spatula, but could not; but on applying a loadstone it immediately jumped out.

"Another person had for a long time been troubled with a great pain and convulsions in his cheek; you might cover the place where the pain was with a penny; the convulsions drew his mouth, face, and eye aside: he had used many things prescribed him by physicians and surgeons, but to no purpose. I applied a cupping glass to the place with fired flax in it; then scarified and cupped him again; after which I put on a plaster of diapalma, and he was perfectly cured. I was consulted by a maid who had a pustule broke in her eye out of which there came fine small sand, like chalk, for many weeks together. By the use of purging, fumigation, and some tonics, she recovered her sight in a very great measure."

In volume 15, page 109, will be found some observations on the practice of physic by Dr. Turberville, of Salisbury.

"A gentlewoman was much troubled with falling sickness; in her water I saw a great number of short worms full of legs, and like millepedes; I gave her two or three purges, first with pil. agaric. and rhubarb, but still perceived in every water that was brought to me eight, ten, or more of the worms. They appeared lively and full of motion, and the fits continued daily. At last I gave her half an ounce of oxymel helleboratum in tansy water, which wrought well and was successful, so that she had a complete cure.

"About six or seven years since I had a gent^m. (Mr. Oyliff) in cure for his eye, which was as large as my fist, black and fleshy, and full of bluish bladders, this I judged to be a cancer. After bleeding and purging I cut out the ball and ulcered flesh by many cuts, which were all insensible to him, till I came to the optic nerve; at the last cut he complained, and bled a little; the wound was healed in about a fortnight; he now wears a black patch over the place. Not long after this a young man had an eye as large as a hen's egg, very fair, without blemish, rheum, or redness, and his sight was pretty tolerable. I judged these symptoms to proceed from thin humours fallen on the eye and distending its coats. I cured this distemper by applying drying medicines to the head and eyes, and making an issue in nucha. *Appello morbum oculorum bovinum, sive oculi hydropem.*"

Turberville deserves to be remembered for his use of the magnet in removing foreign bodies from the eye. Hirschberg[3] points out that the word iris here does not mean that the foreign body was actually in the globe, but that it was embedded in the cornea at the limbus. Of the other cases described in these letters it is impossible to be sure, but the last case would seem to be a case of buphthalmos, while it has been suggested to me that the thirty stones may conceivably have come from a dermoid. The case of total colour blindness is interesting. I surmise that Mr. Oyliff may have had an old staphylomatous eye.*

On June 22, 1668, Pepys notes in his diary, "My business was to meet Mr. Boyle, which I did, and discoursed about my eyes: and he did give me the best advice he could, but refers me to one Turberville of Salisbury, lately come to town, who I will go to.

"June 23, to Dr. Turberville about my eyes, whom I met with: and he did discourse, I thought, learnedly about them; and takes time before he did prescribe me anything, to think of it.

"June 29, to Dr. Turberville's, and there did receive a direction for some physic, and also a glass of something to drop into my eyes: he gives me hopes that I may do well.

"July 3, to an alehouse: met Mr. Pierce, the surgeon, and Dr. Clerke, Waldron, Turberville, my physician for the eyes, and Lowe, to dissect several eyes of sheep and oxen, with great pleasure, and to my great information. But strange that this Turberville should be so great a man, and yet to this day had seen no eyes dissected, or but once, but desired this Dr. Lowe to give him the opportunity to see him dissect some.

"July 5, about four in the morning took four pills of Dr. Turberville's prescribing for my eyes, and I did get my wife to spend the morning reading of Wilkins's Reall Character."

*Dr. Ernest Thomson writes to me suggesting that the case of bursa oculi may have been a dacryops or the remains of such a cystic structure.

Turberville married Ann, daughter of the Rev. James Ford of Hawkchurch, Dorsetshire; he lies buried in the nave of Salisbury Cathedral, and has the following inscription on a mural tablet on the west wall; under a shield of arms given below:

S.M.

D'AUBIGNY TURBERVILLE M.D. et Annae uxoris carissimae
Haec Stemmate Religione, spectabili progenata
Jacobi Ford Ecclesie de Hawchurch Dorcestriae Comitatu
Pastoris vigilantissimi filia:
Optimo marito uxor optima,
Cui Pietas, Prudentia, aliaeque omnes Virtutes
Pari jure summeque dilecto.
Ille ex utraque Prosapia illustri pariter et antiqua oriundus,
Weyfordiae agro Somersetensi natus
Dei cultor sincerus & assiduus Egenis largus, Universis
Amicus facete comis et beneficus;
Denique grande Probitatis exemplar emicuit;
Caeterum OPTHALMIAE Scientia adeo praecelluit,
Ut IPSE, solus ab omni terrarum parte,
Pulchre notus fuerit et celebratus
Cujus Fama hoc Marmore perennior nunquam peribit.

Naturae Concesserunt
Haec XVth Decembris Anno Aetatis LXXX^tio MDCXCIV
Ille XXI Aprilis Anno Aetatis LXXXV MDCXCVI

Oh nostram omnium sortem lugendam!
Quali fruebamur dum Enituit vivus
Quanto privamur, cum infra jacet extinctus
Solus oculorum Aesculapius.

The shield of arms is as follows: ermine, a lion rampant gules crowned or, for Turberville, impaling, per fesse in chief a greyhound courant and in base an owl within a bordure engrailed argent and sable, all countercharged. (N.B.—The owl has at some time or other been painted wrongly gold.)

His will was proved in London, May 14, 1696. The abstract is as follows:

DAWBENEY TURBERVILE of the Close of the Canons of the Cathedrall Church of Sarum, co. Wilts. Doctor in Phisicke. (P.C.C., Bond 82). June 24, 1695. To be buried in Cathedrall as near my wife as can bee. To Anne Bragg of New Sarum, widow, £150. To Edmund Turbervile liveing near Appothecaries Hall in London, gent. £100. To Sister-in-law, Mary Minterne of Crewkerne, co. Somersett, widow, £100. To Godson Turbervile Bonvile, £100. To the brothers and sisters of said Turbervile Bonvile, £10 each. To ———— Bonvile, spinster, aunt to said Turbervile Bonvile, £20. To Godson Dawbeney Bentley, £10, and one of my largest silver tankards. To Cosen Anne Davies of City of London spinster, £50. To the eldest daughter of Captain James Bale of Crewkerne, £10. To Cosen Mary Davies

£10 to buy her mourning. To Robert Sayer, son of Israel Sayer, of the City of London, widow (*sic*, but it presumably means that Israel was dead) and his heirs for ever my right of presentation and advowson of the Church of Weyford near Crewkerne and if he shall be educated at the University of Oxford then to have £50 towards his expenses. To the servants now liveing with me, *viz.*—Christopher Hellyer, Elizabeth Hewlett, and Mary Braden, £10 each if with me when I die. My term of years in a house in Sarum Close leased me by the Vicars Chorall of the Cathedrall to my sister Mary Turbervile of the City of London and to ffrances Davis of the said Close of Sarum and now liveing with me, joyntly and to the longest liver of them. But if after my death the said Mary Turbervile shall ever lodge, harbour or in any manner entertaine either by day or night one named Catherine Eller (or whatever she may be named) formerly liveing in the said Close of Sarum, then the said Mary to have no advantage in her moiety of the said house. To the poor of the Parish of Weyford aforesaid £100 to be laid out in lands. To the Poor of the Close of Sarum(?) to be dispersed amongst them by the Dean and Canons Resident. To the Poor of each Parish of New Sarum, £5. Residue to said Mary Turbervile and ffrances Davis, and they to be executrixes. My friends Thomas Turbervile of Beer Regis, co. Dorset, esqre., Richard Barnaby the elder of Ambersbury, Wilts., gent. and William(?) Burner of Bermeston, Wilts., gent., to be trustees and supervisors to assist said executrixes and for their trouble to have £10 each.

Witnesses: Hampton Jay, Anne Haskett, Mary Davis, John Wells.

The amount at which the estate was sworn is not given; at this date it very rarely is.

Frances Davis married a man named Blackborow, of the Close. She died October 11, 1716, aged 55 years.

Dr. Turberville occupied a house near the St. Anne Street Gate, the third house on the north side of the road from it. One of the Canons of Salisbury lives there now; it has a very fine ceiling in the drawing-room with the crest of the Cecils: it is supposed to be the crest of Lord Burleigh.

I cannot offer any probable explanation of the old man's rooted antipathy to Catherine Eller; let us hope that she was only one of his dissatisfied patients. Nor can I account for the two different coats of arms, checky in the reign of Edward the Third and as given on the monument. Burke's General Armory gives: Ford, of Chagford, Ashburton, Bagtor and Nutwell, co., Devon, supposed by Prince to be descended from Forde of Fordemore in Moreton-Hampstead. Per fesse argent and sable, within a bordure engrailed, in chief, a greyhound courant, in base an owl, all countercharged; while from Papworth's Ordinary of Armorials we get: Argent, a lion rampant, gules (among many others). Hugh de Torbervile (A) Harl. MSS. 6137. Turevile (D) Turbervile, (E) de Turbervile, (F) Vandernot, co. Lincoln. The

A. D. E. F. refer to the rolls in the Harleian MSS. in which the coats are found.

I like to imagine the old man "when the bell till'd, to use the Salisbury frase, to evening prayers," sitting in his seat in the Cathedral—

"Where through the long-drawn aisle and fretted vault
The pealing anthem swells the note of praise."

listening to the longwinded sermons of perhaps his friend Bishop Seth Ward, and pondering maybe on some of the illustrious figures of the past connected with the City and Cathedral. Of William of the Long Sword, the warrior Earl of Salisbury; and Bishop Roger, the Grand Justiciar, who, on the authority of Bishop Stubbs, owed his rise to favour and his place in the confidence of Henry the First, to the expeditious way in which he got through divine service; and wishing probably that his successors in the throne at Salisbury had followed his example in this respect.

In conclusion I must express my best thanks to Miss Targett of Salisbury and to Mr. J. J. Hammond, Clerk to the Dean and Chapter for much assistance, particularly to Mr. Hammond for references and much local help; to my brother, the hon. Librarian of Southwell Cathedral, for the heraldic notes and to Mr. Gibbons for the abstract of the will.

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REPORT ON THE CASES OF GLIOMA RETINAE TREATED AT THE ROYAL LONDON OPHTHALMIC HOSPITAL DURING THE YEARS 1915-1924

BY

R. C. DAVENPORT

MOORFIELDS RESEARCH SCHOLAR

IN 1890 Lawford and Collins published in the Royal London Ophthalmic Hospital Reports (Volume XIII) a review of the cases of glioma retinae treated in the hospital from the year 1871.

This record has been kept up by Marshall (Volume XIV), Owen (Volume XVI), Berrisford (Volume XX) bringing it to the year 1915. The following paper brings it up to 1924.

During the 10 years, 1915-1924, there were 27 cases of glioma retinae treated in the hospital. All these were proved by microscopic examination, and they bring the total since 1871 to 163.

Sex. Males 16; females 11.

Eyes involved. Bilateral 5, *viz.* 18.5 per cent.; R. 7; L. 15.

Of the bilateral cases 3 had excision of both globes and of these two are known to be alive and the third may be presumed to be alive 10 years after removal of the second eye, for, though the case cannot be traced, there is no death record at the General Register Office. One case (of unusual interest—to be referred to again below) is reported very well 7 years after the second eye was removed and the other $2\frac{1}{2}$ years.

Age when any lesion was first noted. It is not possible to be quite certain in several cases of this date but as far as can be judged, the following are the ages of the children when anything amiss was noticed:

Birth, 1; 1 to 3 months, 1; 4 to 6 months, 2; 7 to 12 months, 6; 1 to 2 years, 4; 2 to 3 years, 5; 3 to 4 years, 3; 4 to 5 years, 4; 7 years, 1.

With regard to the date at which the second eye was involved: 2 were bilateral when the case was first seen. One was noted within 12 months after the first eye was removed; 1 was noted within 13-14 years after the first eye was removed (see below).

Mortality and Recovery. Of the 27 cases 8 are known to be dead, 12 are known to be alive, and 7 cannot be definitely ascertained. Of these, 3 have been seen one year after operation and found free from recurrence and in all the 7 cases there can be found no death record at the General Register Office.

In the cases known and presumed alive the following periods have elapsed since removal of the growth in each case.

	Case No.	Years
known alive	5	10
	8	$9\frac{9}{12}$
	9	8
	19	7
	3	6
	16	$4\frac{9}{12}$
	23	3
	12	$2\frac{8}{12}$
	21	$2\frac{5}{12}$
	25	2
	18	1
	27	1
presumed alive	11	10
	13	10
	4	$9\frac{1}{2}$
	14 (clear 1 year after)	6
	7 (clear 1 year after)	$4\frac{1}{2}$
	22	3
	24 (clear 1 year after)	3

As three years is given as the safety limit for freedom from recurrence it will be seen that 7 cases may be regarded as known "cured," while to that number can most probably be added some from the remainder not known to have died from recurrence.

Of the fatal cases 2 were bilateral—the others unilateral. The length of time there was a lesion suspected by the parents varied, but on the whole the cases were brought to hospital much later than the average as can be judged by scanty histories. In several cases no action was taken for several months—in some till the redness and pain of increased tension in the eye obviously acted as a stimulus to the seeking of advice.

In only 17 cases are the end results and histories both sufficiently certain to give figures.

Of 8 fatal cases a lesion was noticed (on average) for 13 months. Of 9 "cured" cases a lesion was noticed (on average) for 3 months.

The fatal cases include 2 where the condition was bilateral and the parents were convinced only after long delay that excision of the second eye was advisable. Leaving out these two the average still remains high, *viz.*, 10 months.

The length of life after the appearance of the signs varied from a few months—about 9-12—to a much longer period; 2 cases surviving for over 3 years after the eye was known to have contained a glioma growth, operation being delayed till shortly before death. In all the fatal cases where a globe that was not obviously externally involved, was excised, the optic nerve at its point of division was microscopically shown to be invaded by cells of the glioma. In no case that recovered was the nerve found involved. Only one case died in hospital and no autopsy was possible. The cause of death was meningitis following the removal of a large fungating mass from the orbit of a child whose other globe had been removed 2 years previously for a glioma verified by section.

One case of recurrence was admitted to a hospital for children in London and there died. The autopsy showed extensive backward spread of the growth into the brain with a deposit at the back of the other orbit.

In no case has there been any true evidence of glioma in a shrunken globe with or without glioma in the other eye. The bilateral cases (with the exception of the case to be mentioned later) have shown typical progress in the second eye. One is of some interest (No. 21) where both eyes were found involved in 1921. The left was excised and right excision advised, but declined by the parents who took the child to another hospital. Here it was watched till June, 1923, when the globe was so full of growth and likely to rupture that the parents consented to

removal of the eye. This was done then and the child is reported free from recurrence—now 2½ years later—a somewhat remarkable feature.

One case of especial interest is found in the series and has been reported by Maghy (*Brit. Jl. of Ophthal.*, August, 1919). Briefly, the right eye was excised at the Royal London Ophthalmic Hospital at the age of 2 years in 1900 for a glioma—proved microscopically—and not invading the optic nerve. The child was reported well in 1905—the left eye apparently normal according to the local doctor's report. In 1913 the girl had a series of "fits" lasting over a period of three months and on Christmas Day of that year suddenly "went blind" in her left eye. This remained so and she was treated under the local doctor till October when she was admitted to hospital the eye being in a state of secondary glaucoma with an opaque lens. As projection was accurate linear extraction was performed successfully, but later the tension became raised again and exudate appeared in the anterior chamber, and at this time the nasal field was found defective. After several operations, chiefly for increased tension, the eye settled down and when discharged in March, 1915, the vision was 6/60 with a plus 12.0D. sphere. Later, vision declined and tension rose at intervals and despite many operations to control it, remained high, and subsequently on account of severe pain the eye was excised in May, 1918 (almost 18 years after the first eye), and on section was found to contain a growth, beyond doubt a glioma retinae. This, in spite of its presumed early existence, had not got beyond the globe and now the girl (7 years later) is reported to be very well and, free from trouble in either socket, is wearing two artificial eyes.

The history of this case appears unique as differing from any case in which a glioma was found in an eye which had become shrunken at or near the time the fellow eye had a glioma within it. Here the eye was apparently normal for 13-14 years, and then began a 4½ years' history of increased tension and failure which ended in the proved existence of a glioma retinae. The globe never shrank at all, but the long history subsequent to 1914 suggests that either temporary retrogressions may have occurred or else that its malignancy was unusually low perhaps because of the age of the patient. There was no sign of extra-ocular extension nor has there been any recurrence.

Pathological Findings. All the eyes have been submitted to examination and proved true gliomata. In one case no section was cut off the growth owing to its extensive calcification from degeneration. Macroscopically it was typical in appearance, and the fact that anything amiss with the eye had been noticed only four months makes the extensive calcification somewhat unusual.

No recurrence has taken place since the excision of the eye ten years ago and the child is reported perfectly well.

Family History. In no case was there any evidence of a familial or hereditary tendency to glioma retinae.

I wish to thank the members of the surgical staff at Moorfields for the permission to make use of their case records and the facilities given me as Research Scholar to collect the details shown in this paper.

THE AFTER RESULTS OF CORNEO-SCLERAL TREPHINING FOR GLAUCOMA

BY

R. C. DAVENPORT

MOORFIELDS RESEARCH SCHOLAR

THE following paper is made up entirely on examination of the results of the corneo-scleral trephine operations performed at Moorfields by the present surgical staff during the five years 1919-1923.

All those cases where the records are available have been included and probably the numbers represent almost all such operations done.

The review is presented quite candidly with no bias for or against the operation. The records kept were made in the usual rush of the hospital's work, and not with a view to critical examination later. Accordingly, in many cases they lack of necessity the completeness that a critical examination might desire. Many of them cease abruptly so that the result can only be judged at a point shortly after operation. Others are carried on for some years from operation and thus are of greater value. It is true that the latter are mostly those in which vision was grossly impaired at operation—a fact which has presumably made the patient more zealous in attendance so that further decline might be guarded against if possible. The early glaucoma case with good vision ceases attendance, in many cases, soon after a successful operation, and it seems justifiable to suppose the success of the operation to be prolonged, if not actually total, where the patient does not return to complain of any departure from the satisfactory condition noted soon after operation.

In judging the effects of the operations it has been necessary to rely, as said before, on scanty records. These embrace chiefly the tension of the eye to fingers and the visual acuity. Perimetric records have been far too limited to be used in judgment; indeed where the vision has remained as before the operation and essentially full, and the tension normal, the fields have not, as a rule, been charted, and the few that are shown do not suggest

that coincident with other satisfactory features, there is a gross loss of visual field.

In all 536 records were investigated. Nearly 100 of these were trephine operations in cases not obviously primary glaucoma. These are made up of secondary glaucoma from irido-cyclitis, dislocated lens, vitreous forwards after lens extraction, old interstitial keratitis, some cases of buphthalmos, etc. All these are excluded in the more critical part of the review which is meant to show the actual results in primary glaucoma. At the same time it seems certain that in many cases of increased tension obviously not the result of primary glaucoma, a trephine operation has been very successful in lowering and keeping lowered for a considerable time at least, the raised tension. Another feature which comes out is that although the eye trephined may have been liable to relapses of irido-cyclitis over many years it seems to stand a trephine operation well and not to react by an immediate sharp exacerbation of the inflammation. In view of the frequency with which a trephine operation in an eye never previously the subject of iritis is followed by quiet inflammation this seems strange. Also it is a little surprising perhaps how often the trephine hole escapes blockage in an eye so constantly throwing out exudate, in view of the fear very often felt that the hole will become blocked by uvea or exudate in a perfectly quiet eye.

The table below shows in broad outline the condition of 405 eyes trephined for primary glaucoma—a few in acute and subacute cases, most in the chronic types. This number includes all the cases where the record is of any value and where the condition of raised tension was not obviously secondary. The cases have been divided into three groups under the visual acuity of the eye, *viz.*: Group A 6/6 - 6/12; Group B 6/18 - 6/60; Group C less than 6/60.

Before operation.	In Group A when last recorded.	In Group B when last recorded.	In Group C when last recorded.
Group A. 154	124 (80.5%)	23 (15%)	7 (4.5%)
Group B. 104	31	57	16
Group C. 147	20	26	101
Total 405	175	106	124

The figures need a little examination and review.

Firstly, the 20 cases that improved after operation from less than 6/60 to better than 6/12 were mostly, probably all, cases of acute or subacute glaucoma where the poor visual acuity was due to circulatory interference and haze in the media rather than to damage to fibres of the optic nerve from pressure. If these cases be excluded it will be seen that the results show:

A.	154	before operation		155	after operation
B.	104	,,	,,	106	,, ,,
C.	127	,,	,,	124	,, ,,

There are the individual cases altering somewhat in acuity, but the figures above are somewhat striking in showing how, in the main, the visual acuity is not greatly altered for better or worse by a trephine operation in chronic glaucoma. That it should be greatly improved is not to be expected where the nerve fibres are damaged, but that the general result shows that it is not lowered by the operation is sound evidence in support of its efficacy. It would seem to show that the mutilation required for maintaining permanent drainage, and thus reasonably normal tension, is minimal. Also it must show how in the great majority of cases the object—*viz.*, the maintenance of such tension—is achieved, for otherwise greater decline of vision would be shown.

Group A comprises of course the cases favourable for operation where the visual acuity is still nearly normal—symptoms are present, tension often raised, and some alterations always present in the visual fields—either peripheral or paracentral.

Of these cases 80 per cent. were apparently successes and only 4.5 per cent. complete failures.

These figures seem very good in view of the possible failures both from progress of the condition and from such events as operation accidents, infection, etc. The patients are mostly in later middle age or actually aged, and are not from the general point of view entirely suitable subjects, and yet such good figures are obtained. The seven failures included three of infection, the others being eyes that steadily went down in spite of repeated trephining, and other operations for relieving the raised tension.

The operation in use is the typical Elliot operation performed with the 1.5 mm. trephine. Two slight departures have been used to some extent, *viz.*, complete iridectomy instead of the peripheral buttonhole and finally stitching the flap carefully back along its whole length to make an early watertight union with a view to securing rapid widespread filtration and oedema beneath the conjunctiva. A review of the untoward effects of the operation is covered by the following table.

Immediate.

Vitreous loss.
Loss of the disc of sclera into the eye.
Haemorrhage (into vitreous or in fundus).
Prolapse of iris.
Detachment of retina and choroid.
Infection (quiet iritis, acute infection).
Mania.

Remote.

"Late" infection.
Poor drainage and increased tension.
Cataract.

Vitreous Loss.—There are seven cases in which this is reported. All were cases of very advanced glaucoma and nearly all senile patients. Some of the eyes quietened down not getting any sufficient increasing tension to require excision of the eye. Three of them could only be relieved by excision of the eye. In no case of a middle aged patient with early glaucoma and good vision was vitreous lost.

Loss of disc in the eye.—This is only noted in three cases though probably more common and there is no evidence that it produced any ill effects whatever.

Haemorrhage.—One elderly woman had an extensive haemorrhage into the vitreous after operation. Eight patients—almost all elderly—*viz.*, over 60—are noted to have shown haemorrhages in the fundus after operation. Some of these cleared quickly—in others there were further fundus changes around the macula with associated decline in visual acuity. This number seems reasonably small in view of their ages and the liability of all such patients to get haemorrhages and fundus changes from vascular disease and senile lesions quite apart from any operation.

Iris prolapse.—In two cases this is noted where no iridectomy was done at operation. In one case it immediately followed the operation—the prolapse was excised and the eye was left with normal tension and 6/18 vision.

In the other case it followed long after operation and there was infection, the case coming under the "late" infections recorded below.

Detachment of choroid.—This is only recorded in ten cases, and in all, the detachment rapidly subsided and later examination showed a normal fundus picture from this aspect. Its effect on vision appeared almost *nil*, the end result showing the acuity roughly the same as before operation.

Infection

(1) *Quiet iritis.*—This appears to take place in the great majority of cases. In spite of the immediate use of atropin after operation, most cases show a little iritis. In a few cases where perhaps no atropin has been used the pupil has become extensively bound by posterior synechiae, but in the great majority the iritis has been shown only by a little uveal deposit on the lens with sometimes very slight adhesion between capsule and iris. The effects of the mild iritis seem very slight—this examination of the results of the operation was partially started with a view to seeing how often the 6/6 eye, though perhaps put into a state of safety by drainage,

was left with vision lowered to say 6/12 by the effects of the iritis. So little exudate must be produced that the acuity is very seldom measurably lowered. Group A admittedly lumps together all cases with V.A. 6/12 or better, but examination of the details shows little evidence that there is a small but perceptible decline in acuity in full vision eyes as a result of the quiet inflammation which almost always appears to take place. Nor does there appear sufficient exudate thrown out to cause blockage of the small peripheral iridectomy or the trephine hole. There appears little or no evidence that the cases where drainage is impaired have had more serious production of exudate from the iris than the cases with sound drainage.

(2) *Acute Infection.*—Two cases of acute infection immediately after operation are recorded and in one the eye was lost, the other quietening down.

Mania.—Two or three very elderly patients are reported to have become mentally deranged while in hospital, but as the restriction is much less than after cataract extraction so the liability to mania is accordingly less.

Remote

Late infections.—In all, fourteen cases of "late" infection were treated during the years under review. Some of these were operated on in years previous to 1919—others during the five years recorded. To quote all these against the number of trephine operations done in this time seems a fair way of measuring the frequency of this misfortune. The majority of cases occurred a few months after the operation—one case as late as seven years after. The type of infection varied—in some there was a leaking or staining area over the trephine hole with acute iritis, hypopyon or even panophthalmitis, in others there was a quieter type of plastic inflammation not so easily traced to infection from the trephine hole and in one case definitely associated with a generalized toxaemia producing widespread rheumatoid arthritis. Thus it seems that some at least are accidental in so far as an irido-cyclitis happens to be set up in an eye previously trephined, the infection being due to a blood toxaemia and not to a liability to infection through a hole connecting the inside of the globe with the outside. In eight of the cases however it is clearly an infection *via* the trephine hole.

Serious and unfortunate as the accident is, the result is by no means hopeless. Most of the cases occurred in old people, eleven out of fourteen being over 60 years, and yet of them all, evisceration was only necessary in two cases and when on treatment

the inflammation had subsided six of them were left with vision 6/12 pt. to 6/18 pt. In two or three of the others lens opacity was the cause of impaired vision after the inflammation and this may have been quite independent of the infection. Thus the late infection, while a serious if not very frequent misfortune, is hardly the bogey it is often made out to be with regard to the total abandonment of the trephine operation.

One of the cases is of interest in so far as infection came about in a 6/18 eye some six months after trephining. On treatment of the kerato-irido-cyclitis it all settled and he was left with vision little impaired, *viz.*, 6/18 pt. Two years later his other eye also 6/18 from glaucoma, was operated on by Holth's "punch operation." Two months later this eye became acutely inflamed and though the inflammation subsided it relapsed later so severely that excision was performed.

Poor drainage and relapse of tension.—In the great majority of cases one trephine operation has left the eye with normal tension up to the last record available. In a few cases, however, in spite of an apparently successful operation, drainage was never satisfactory and increased tension continued. In some of these a second operation was at once successful, in others many operations—three or four trephinings sclerotomy, iridectomy—all failed to produce normal tension and the vision failed steadily. There seems to have been no constant feature of the cases with regard to age, history or appearance of the condition. At the same time it is quite obvious in looking through the records that the older patients do not do so well. In some there is clearly maintained high tension—in others it is only that vision declines slowly in spite of an apparently safe tension. In some of these there is an obvious cause such as lens sclerosis or fundus changes —vascular or degenerative. But in several cases of the senile glaucoma type—patients over 65 years say—there has been steady loss of vision with shrinking fields and increased excavation and pallor of the discs in the presence of a normal tension.

The records would suggest a "malignant" type at any age which is hard to check and control, and in addition a type that *may* come under such a heading as "senile cavernous atrophy of the discs," where the tension does not appear raised and where drainage does not check the progress of the condition as in a more straightforward case. Only a few can be put in such a class and all are old people. The available records, however, do not make it possible to differentiate them at all sharply.

Cataract.—There is little or no evidence that the trephine operation predisposes to cataract. No eye of class A developed cataract as a sequel to the operation. Some of the older people were found

to have lens opacity at operation, others after operation, but there is no evidence that the operation can be held responsible. In some, as would be expected, lens opacity appeared some years after a successful trephine operation in an elderly patient. In some of the cases that did not do well cataract developed, suggesting that an imperfect or unsuccessful operation was much more likely to be followed by cataract than a successful one.

The results of extraction of the lens after a trephine operation do not seem successful as far as vision goes. There are only three or four isolated cases and in all these vision was poor after the extraction, successful though the operation was. At the same time vision was not good before the cataract developed—as far as the records can show.

This paper is the outcome of part of my work as Moorfields Research Scholar, and I have had free use of all the patients' records.

For such facilities and for permission to publish the results I am indebted to the surgical staff whom I wish to thank.

ON THE VISIBILITY OF THE NUCLEI OF THE ENDOTHELIAL CELLS OF THE CORNEA IN MAN

BY

T. HARRISON BUTLER

BIRMINGHAM

THE nuclei of the endothelial cells are easily seen in the eye of the pig, but it is generally held that they are invisible in the human cornea.

I have just examined an engineer, aged 51 years, who in his younger days had been a miner. His endothelial cells were unusually large and I was astonished to find that the nuclei were perfectly visible. Using ocular 2 and objective A3, a magnification of 35, the cells were seen to be hexagonal and in the centre of each there was a dark dot. This did not alter in appearance with any modification of the focus and was not therefore an optical effect. The appearance was exactly similar to that seen in the pig's eye and I have no doubt that I was looking at the nuclei. I immediately with the same optical system examined another normal patient and was quite unable to see the nuclei and also confirmed the observation that the miner's cells were abnormally large. The nuclei were visible in both corneae.

REMOVAL OF CATARACT WITH THE CAPSULE

BY

DR. ANDREW LICSKÓ

BUDAPEST

OPHTHALMOLOGISTS still differ on the subject of the removal of senile cataract in the capsule, though the ambition of operators to achieve this ideal result with regard to vision is of considerable antiquity. S. Sharp in 1753 and Daviel[1] in 1782 both performed intracapsular extractions; and since Pagenstecher's[2] work in 1874 the operation has taken its place as a recognized procedure.

The operations for the intracapsular extraction of cataract may, as regards operative technique, be divided into three classes: in

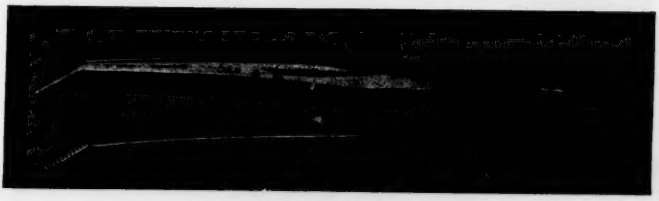

FIG. 1.

the first method the zonula is torn by pressure on the cornea from without; in the second by means of instruments constructed specially for the purpose; and in the third the removal of the lens is executed by suction apparatus.

The operation as carried out at the No. 1 Ophthalmological Hospital of Budapest (Director, Professor Emile de Grósz) differs but slightly both as to technique and instruments used from the ordinary extracapsular extraction as performed in this hospital for several decades. I have sometimes experienced in performing the ordinary extraction that the capsule of the lens was not torn by the capsule forceps employed, but luxated, and the lens and capsule were removed together. Observing this circumstance I noted that it was not due to the thickness of the lens capsule but to the fact that the teeth of the forceps (Schulek's, Fig. 1) which were usually employed had become worn. I then had a Schulek forceps made with the teeth carefully ground down (Fig. 2) and used this for the purpose. It is essential that the forceps should not be sharp for then it will inevitably cut through the lens capsule.

The operation with this forceps is performed as follows: for twenty minutes prior to the operation one drop of 5 per cent.

cocain-tonogen solution is dropped into the eye three times every five minutes, and just before the operation one drop of 1 per cent. atropin. Snowden's speculum is used in order to keep the eyelids widely apart, and in most cases the superior rectus is fixed as described by Blaskovich[3]. The thread is stitched through the rectus without freeing the conjunctiva. An incision somewhat larger than one-third of the cornea (except in cases of Morgagnian cataract) is then made with a Graefe knife. A large

FIG. 2.

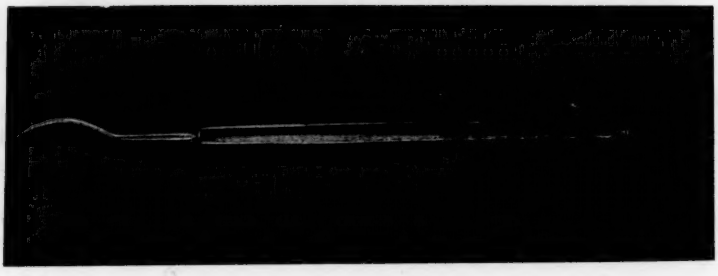

FIG. 3.

conjunctival flap is cut and folded back. I consider it essential to perform an iridectomy as the complete lens in its capsule forces the edges of the iris into the wound. The toothless forceps is then employed to take a broad hold of the capsule at the equator, or preferably a little above it, and gently closed. It is advisable to take hold of the capsule rather above the equator as if it is seized at a lower level the lower part of the zonula may give way first and the lens appear in the wound with its transverse diameter, an event which, though not in itself dangerous, may, if the section is not large enough, lead to rupture of the lens capsule. The operator makes lateral movements with the closed forceps

so as to rupture the zonula and draw the lens into the wound. At the same time pressure is exerted from below upwards along the lower border of the lens by means of the annular expressor, an instrument also devised by Schulek (Fig. 3).

If the lens is not in very close connection with the capsule the latter readily gives way after a few lateral motions, following which the lens is immediately luxated into the anterior chamber and easily removed. It is sometimes advisable, apart from the lateral movements, to push the lens upwards. If, however, the lens is in close connection with the zonula, which can be perceived immediately on attempting the extraction, it is preferable to exercise a steadily increasing pressure sideways and upwards, instead of the lateral jerks, assisted of course by the annular expressor, since it may happen that the lens capsule is less resistant than the zonula and gives way first. Not the least important part of this operation is the pressure brought to bear on the lower edge of the lens. This pressure must be constant, steady, and not too hard. The hand holding the instrument must always feel the elasticity of the vitreous which rolls out the lens under the united influence of the aforesaid factors, the traction of the forceps and the pressure exerted by the instrument. Should the pressure exceed the elasticity of the vitreous the hyaloid membrane will rupture and the lens fall back into the vitreous displacing this structure into the wound. After the lens has been removed the edges of the wound must be carefully cleaned and replaced. This concludes the operation. Both eyes are bandaged for one day and the eye that has been operated on for five days.

In the two and a half years dating from January, 1923, I have dealt with 204 senile cataracts in the way described at the No. 1 Ophthalmological Hospital, Budapest. Sixty-one, *i.e.*, 30 per cent. were successful. This percentage has improved during the last six months to 50 per cent. as the technique became more perfect. Experiences with regard to operative technique, recovery, and final results have convinced me of the value of the operation.

The low percentage of successful intracapsular extraction may be taken to show that the operations were carried out with the utmost care, and that the lens capsule was ruptured in preference to running any risk of vitreous loss. To this caution it is due that in the whole series there was only one case of vitreous loss during the operation. This occurred on making the section in a case of complicated cataract. In two other cases, one of normal and the other of complicated cataract the patient pressed the speculum on the eye at the end of the operation and caused vitreous loss. In the normal case vitreous loss was followed by irido-choroiditis, the only case of post-operative infection that

occurred. Recovery was prolonged in one case by a protracted mild iritis; the final visual result was 5/7. In one other case irido-dialysis with considerable haemorrhage resulted from the iris being adherent to the lens capsule; the final visual result in this case was 5/10.

Number of Cases.	Complications.		Wound reopening.	Infection.	Final results.		
	Prolapse of vitreous.	Irido-dialysis.			Vision.		
					5/5. 5/10.	5/15. 5/30.	5/30. 5/70.
Non-complicated cataract: 57.	1*	1	12	Iritis 1. Irido-cyclitis: 1.	48	6	3
High Myopia and cataract: 2.	—	—	—	—	In one case peripap. atrophy of choroid, 5/30. In another case vitreous haze; distinguishes fingers at 3 yards.		
Complicated cataract: 2.	1+1*	—	1	—	In one case, ablatio retinae. In another case, ablatio retinae; c̄+ 10D. sph. distinguishes fingers at 1 yard.		

* Patient, after operation, pressed the speculum on his eye.

In twelve cases the recovery was complicated by the wound giving way, and in one of these paracentesis of the cornea was required. This complication is also met with in extracapsular extraction, and the intracapsular operation cannot be blamed for it. In these cases the final visual results were 5/15 to 5/10 in nine and 5/30 in the remainder. This is a better result than could be expected in the ordinary extracapsular extraction, since in that case the tendency to the formation of a dense secondary cataract from the extravasated blood and lens fragments would be great.

The great gain from the intracapsular operation is the clear vision obtained, at least 5/7 in cases with clear media and a healthy fundus. In one case post-operative astigmatism reached 5D., but as a rule was neither greater nor less than that found after the usual operation.

Amongst the sixty-one cases there were 28 immature, 19 mature, 8 hypermature, 4 complicated, and 1 myopic. I consider that a great advantage of the operation consists in the elimination of secondary cataract especially in operations on immature cases. The procedures necessary for the removal of cortex must cause a certain amount of bruising of the tissues and may possibly lead to vitreous loss. Further, there is the necessity of dealing with the secondary cataract, a procedure not free from risk of infection and secondary glaucoma, and which may not yield an opening of a satisfactory type. A further advantage of the operation here described is to be found in the gentle nature of the procedure which exposes the patient to the minimum of risk.

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ANNOTATION

Nero's Emerald

Our readers are familiar with the story of the use made by Nero of an emerald to assist his weak sight when attending the games in the circus. The general belief was that this particular emerald was concave and that Nero was myopic. Dr. Marc Landolt has contributed a scholarly article on the subject in a recent number of the *Archives d'Ophtalmologie* (Feb., 1926). It appears that the legend is derived from a passage in Pliny and that the meaning thereof depends on the situation of a comma. As Latin writers in Pliny's time did not use commas the necessary comma may be inserted according to the pleasure of the translator. The actual passage reads as follows: "nisi cum conniveret ad prope admota hebetes." One side inserts the comma after the word *admota*, while the other side elects to place it after *conniveret*. In the first arrangement the meaning would indicate that Nero could only see near objects and was myopic. The second reading would indicate that Nero's vision for near objects was defective. In this latter

case Nero could no longer bear the proud position of being the first wearer of a monocle recorded in history. Suetonius in his account of Nero says of his eyes: "oculis ceasiis et hebetioribus." This may mean either that he had grey eyes and defective vision, or that he had grey eyes with a dull lustre. Or even possibly that it was not the iris that was grey but the cornea as a result of some opacity. When this question of the eye has been decided we are not at the end of the difficulty. Pliny vaguely states that Nero as chief of the gladiators watched the fights with an emerald (*Nero princeps gladiatorum pugnas spectabat smaragdo*). This statement comes at the end of a long passage dealing with the nature of the emerald and pointing out the agreeable nature of its colour. He states that the sight after being tired by long use is refreshed by the sight of the green colour of the emerald as also by that of the green beetle, the latter being used by engravers to rest their eyes. Now if Nero used his emerald in this way there is no need to assume that he was myopic. Pliny in a later passage describes quite clearly the effect of the emeralds which were frequently concave in strengthening vision. Unfortunately, his reference to Nero does not follow this account, but does follow an account of the mirror-like properties of a flat emerald. From this arrangement certain writers have concluded that Nero used the famous emerald as a mirror. We agree with Dr. Landolt in declining to accept any such theory. As he points out, if Nero had turned his back on the games, such an unusual performance would certainly have been mentioned. Nero was a successful competitor in the chariot races, and therefore could hardly have been highly myopic or possessed very defective vision.

Nero's emerald is not the only historical instance of the use of a jewel to aid vision, for we have also the story of Wilfrid's beryl. Beryl is a silicate of aluminium and beryllium which crystallizes in long six-sided prisms. The more transparent and finely coloured varieties are known as emerald and aquamarine. Hirschberg deals with Wilfrid at considerable length in Graefe-Saemisch (Vol. XII, p. 268, 2nd Edition). As far as can be ascertained from mediaeval Latin he used the beryl as an aid in reading, so we may assume that in that case it must have possessed magnifying properties the reverse of what has been suggested in the case of Nero.

OXFORD OPHTHALMOLOGICAL CONGRESS

UNDER the Mastership of Mr. Philip H. Adams, recently elected in succession to the late Sir Anderson Critchett, Bart, K.C.V.O., the Sixteenth Meeting of the Oxford Ophthalmological Congress took place at Oxford on July 14, 15, 16, and 17.

No meeting was held last year owing to the Convention of English-speaking Ophthalmological Societies, but with this exception the Congress has met annually since its inception in 1910. The membership, which in that year was 181, has steadily increased to 380 at the present time.

As in past years the proceedings took place in the Department of Human Anatomy through the kindness of Professor Arthur Thomson and members were again indebted to Keble College for hospitality.

The Congress was opened on July 15 by a short address of welcome by the Master followed immediately by a discussion on "Sympathetic Ophthalmitis." The opener, Mr. MALCOLM HEPBURN, began by outlining the history of the treatment of the condition during the past fifty years and comparing this with present-day methods.

With the dread of sympathetic ophthalmitis occurring, even many years after the injury, probably many eyes have been excised in the past which might have proved useful. The general trend of opinion now, however, was against the likelihood of sympathetic trouble appearing after a lapse of years, and it was to those cases of cyclitis developing within a few months after the exciting cause that he directed attention. Not all such cases are of the nature of sympathetic ophthalmitis and some scientific method should be aimed at whereby a cyclitis of sympathetic origin can be differentiated from one due to other causes.

The opener suggested that not all eyes which manifest keratitis punctata, even though of sympathetic origin, should be excised and that many eyes with keratitis punctata following injury or operation should be operated on for the relief of such symptoms. In quoting cases in support of this statement he further emphasized the value of the differential blood count. The finding of a great excess in percentage of the large mononuclear cells with decrease in the polymorphonuclears is a valuable guide in deciding the line of treatment to be taken.

Mr. S. H. BROWNING presented the bacteriological side of the subject dealing chiefly with the question of the differential blood count. Cases were quoted in which a change in the blood count had preceded any other signs of sympathetic ophthalmitis and which determined the line of treatment to be followed. Treatment by arsenical preparations of the "606" type was dealt with and

mention made of anaphylaxis and the anaphylactic theory of the disease.

Dr. G. E. DE SCHWEINITZ (Philadelphia) followed with a special reference to the work recently done by Verhoeff and presented at the meeting of the American Ophthalmological Society. Seven cases of sympathetic uveitis were treated by him by frequent subcutaneous or intra-muscular injections of diphtheria antitoxin in large doses. In four out of the seven a remarkable improvement in vision was obtained, but the effectiveness of the treatment was most striking in causing a rapid subsidence of the inflammatory condition. Dr. de Schweinitz expressed himself as being in agreement with Mr. Browning's views.

Dr. HARRISON BUTLER pointed out the value of the slit-lamp in detecting the earliest signs of the disease and mentioned illustrative cases.

Mr. RUSS WOOD described two cases in which the reaction to tuberculin tests was positive in each.

PROFESSOR EMILE DE GRÓSZ (Budapest) stated that in the past 50 years 150 cases of sympathetic ophthalmitis had been treated at the No. 1 Eye Hospital at Budapest, making 0.28 per cent. of the total patients seen. Ten per cent. of these had followed operations, most of which had been performed elsewhere. In his view repeated operations on injured eyes increased the risk of sympathetic trouble. He was convinced that the inflammation was metastatic in nature.

Lt.-Col. H. HERBERT referred to the iris-inclusion operation for glaucoma and the supposed risk of sympathetic ophthalmitis.

Mr. J. GRAY CLEGG spoke on the occurrence of the trouble after evisceration.

Lt.-Col. A. E. J. LISTER commented on the rarity of the disease in hot dry climates.

The following also took part: Mr. A. F. MACCALLAN, Mr. A. GREENE, Dr. ARNOLD VERREY, Mr. P. C. SUMMERS, Mr. R. J. COULTER, Mr. N. C. RIDLEY, Mr. A. ZORAB, and the Master.

Mr. HEPBURN and Mr. BROWNING replied.

The afternoon was given up to demonstrations in the Scientific Museum as follows: Lt.-Col. H. HERBERT demonstrated an iris-inclusion operation for glaucoma; Dr. G. YOUNG showed statistics on ophthalmometry; Lt-Col. A. E. J. LISTER presented tables showing the weights of 180 cataractous lenses with details as to patients' weights, age, blood pressure, etc. Dr. THOMSON HENDERSON showed microscopical specimens of the ciliary region in mammalia and demonstrated his apparatus showing the mechanism of accommodation. Mr. TOMLINSON demonstrated his light-sense test for the light-adapted eye. Lt.-Col. W. V. COPPINGER showed (*a*) a prothesis of crude Indian manufacture

which had cut through the lid of the wearer, and (*b*) prints of the plans of the new Calcutta Eye Hospital. Dr. BURDON-COOPER demonstrated Pulfrich's phenomenon and brought forward evidence that the explanation was one connected with accommodation rather than with dark-adaptation.

In an adjoining room the most recent ophthalmic apparatus and instruments were on exhibit by a number of well-known firms.

On Friday morning papers were read by Dr. G. YOUNG on (*a*) can an amblyopic eye recover good vision? and (*b*) a suggestion as to the cause of the invisibility of the retinal vessels and explanation of Purkinje's phenomenon. In the former he referred to the case of a man, aged 60 years, with an amblyopic eye associated with internal strabismus who had lost the vision of the good eye from embolism; the vision of the amblyopic eye improved in a year from less than 6/60ths to 6/6ths.

Dr. MARION GILCHRIST presented some interesting medico-legal cases which, had time permitted, would have invoked much discussion.

The Doyne Memorial Lecture was delivered by Dr. THOMSON HENDERSON of Nottingham, who had chosen as his subject "The Anatomy and Physiology of Accommodation in Mammalia." Admirably presented in every way the lecture was followed with the greatest interest. Some original and interesting theories on the physiology of accommodation were put forward whilst the anatomy of the ciliary region was shown in a valuable series of slides and drawings from various mammalia including man. Dr. Henderson was warmly congratulated upon his effort and received at the conclusion of his lecture the Doyne Memorial Medal for the year.

In the afternoon Lt.-Col. H. SMITH, C.I.E., presented a review of the various methods of performing intracapsular extraction of cataract and described in detail his own latest method of expression, the outcome of his work during the past winter in India.

The paper was discussed by Lt.-Colonels LISTER and COPPINGER, Messrs. ZORAB, HARRISON BUTLER, WALKER, COULTER and JAQUES.

On the morning of Saturday Dr. T. S. GOOD, O.B.E., Medical Superintendent of the Oxford City and County Mental Hospital, read a paper entitled "Psychology and the Eye," in which he gave details of cases where the relief of trouble caused by refraction error had had a marked effect on clearing up mental disturbances, and of other cases in which no result was obtained, although eye symptoms were prominent in these but without abnormality in the eyes themselves. Many interesting points were touched on with regard to mental disturbance and sight. This suggestive paper well deserves reading in the original.

Dr. HARRISON BUTLER followed with an instructive paper on the signs of inflammation in the eye when examined by the slit-lamp.

The proceedings of the meeting concluded with a paper by Dr. MARGARET DOBSON on the macular region as seen by red-free light. Some extremely interesting drawings of the appearance presented by the macula in both normal and diseased conditions were shown and revealed changes which could not be easily detected by other means.

The Annual General Meeting was held after the morning session on July 15, when the Council reported that 27 new members had been elected in the past two years, making a total membership of 380, that the attendance at the 1924 meeting was 101, that members and Associate members of the Convention of English-speaking Societies last year had been entertained at Oxford by the Congress and that the financial position was satisfactory.

The Council regretted to report the loss through death of the following: SIR ANDERSON CRITCHETT, Bart., K.C.V.O. (Master 1924-1925); EDMUND LANDOLT (Paris); HENRI COPPEZ (Brussels); S. LEWIS ZIEGLER (Philadelphia), Member of Council from 1911; J. B. STORY (Dublin); S. JOHNSON TAYLOR (Norwich), Member of Council 1917-1923; PERCY BARDSLEY (Salisbury); C. F. HARFORD (London), and J. L. MEYNALL (Manchester).

The Annual Dinner took place on the evening of July 15 in Keble College; amongst the guests being PROFESSOR SIR ARCHIBALD GARROD, K.C.M.G., and PROFESSOR J. A. GUNN.

The Congress was well attended, oversea members being represented by Dr. G. E. DE SCHWEINITZ, PROFESSOR EMILE DE GRÓSZ (Budapest), and Dr. ARNOLD VERREY (Lausanne) amongst others.

ABSTRACTS

I.—LACRYMAL APPARATUS

(1) **Poyales, F. (Madrid).—A new method of lacrymo-nasal fistulization with extirpation of the lacrymal sac. (Une nouvelle méthode de fistulisation lacrymo-nasal avec extirpation du sac.)** *Arch. d'Ophtal.*, September, 1925.

(1) An attempt to portray the method of operating devised by **Poyales** without the aid of his diagrams would convey but little to the reader. The operation as described seems to be in some respects superior to the known methods of dacryo-cysto-rhinostomy, and, as illustrated, is easy to follow: those interested

will do well to consult the original. Very briefly the operation, performed under local anaesthesia, entails:

(1) Dilatation of the lacrymal puncta by a conical dilator; (2) division of both canaliculi lengthwise; (3) two parallel horizontal incisions extending from the lacrymal puncta inwards to the nose, 5 to 8 mm. apart, and joined at their nasal ends by a vertical incision; the rectangular portion of skin enclosed is dissected up from the nasal end as far as the inner canthus where it remains pedicled; (4) the flap so formed is rolled in its long axis, with the epithelial surface inwards, round the finest urethral sound and secured by three or four fine catgut sutures; (5) extirpation of the lacrymal sac; (6) perforation of the superior maxilla in its upper part; (7) passage of the sound, with the cutaneous tube, into the middle meatus of the nose; (8) suture of the horizontal incisions.

The method has been recently practised; the results so far have been satisfactory, but the author undertakes to furnish further information after a longer experience. J. B. LAWFORD.

(2) **Raia, V. L. (Providence, R. I.)—Toti's operation for dacryocystitis with report of sixteen cases.** ***Amer. Jl. of Ophthal.*****, July, 1925.**

(2) In 1915 **Raia** reported twelve cases in which this operation had been performed; subsequent observation has shown that those who were reported as cured immediately after the operation, have remained so, and that in those who were reported as improved, all discharge of mucus or pus has ceased though there was some epiphora in cold and windy weather. The two references for those who wish to read a description of the operation are the article by Toti in the June number of the *Annales d'Oculistique*, 1910 and Raia's article in the *Annals of Ophthalmology*, July, 1915. Of the sixteen cases described in the present paper twelve had an ideal result and four were relieved from infected discharge, though epiphora remained which in course of time gradually diminished. Though the operations were performed under cocain and adrenalin, haemorrhage was always troublesome. To avoid wound infection the nostril on the affected side should be packed with gauze which is not removed for four or five days; the patient is also warned not to blow his nose. The periosteum is difficult to remove with an ordinary elevator; the author recommends the use of a special chisel curved on the edge. The opening in the bone should be 18 mm. long by 15 mm. broad. The middle meatus of the nose must be unobstructed if a good result is to be obtained. Adequate treatment of such conditions as deviation of the septum, enlarged turbinates, etc., must therefore precede operation. It is advisable also that the structure of the canaliculi should not have been interfered with by probing or slitting.

F. A. WILLIAMSON-NOBLE.

(3) **Mann, Ida C.—The treatment of lacrymal obstruction.** *Lancet*, April 11, 1925.

(3) **Ida C. Mann** contributes to the *Lancet* one of the series of "Invitation" articles on "Modern Technique," which has been carried on for some time in that journal. One is inclined to consider that this article, while it forms a useful summary of present-day practice, is hardly one upon which the average general practitioner would care to act. The fact is that lacrymal disease, while it is, in a way, a common-place condition and one which many people bear with patience, though very inadvisably, for many years, is nevertheless not one the treatment of which by surgical means can be lightly undertaken by relatively unskilled hands. Even the passage of a probe requires a certain lightness of touch if damage is to be avoided, while excision of the sac, referred to in the article as a simple operation, is not a simple operation in the hands of the inexperienced. The article, as has been said, is a good summary of the "Modern Technique," but one cannot recommend the operative treatment, at any rate, of lacrymal obstruction to the general practitioner.

ERNEST THOMSON.

(4) **Wegner, W. (Greifswald).—Actinomycosis in a polyp of the upper tear duct. (Aktinomyces im Polypen des oberen Tranenröhrchens.)** *Zeitschr. f. Augenheilk.*, Vol. LVIII, p. 123, 1925.

(4) **Wegner** describes a rare case of actinomycosis affecting the lacrymal passages. The patient came under observation complaining of a polyp protruding from the upper punctum. This was dilated and the lacrymal duct syringed through, and the polyp removed. On slitting up the duct a considerable amount of granulation tissue was noted associated with it which, however, on removal and subsequent examination, proved to contain typical actinomycotic bodies. In this somewhat rare affection the literature shows that involvement of the upper punctum is very unusual, the lower being usually the site of the lesion; moreover, it is rarely accompanied by exuberant granulation tissue formation or by polypi.

W. S. DUKE-ELDER.

(5) **Ling, W. P. (Peking, China).—Anomalous duct of lacrymal gland associated with other congenital anomalies.** *Amer. Jl. of Ophthal.*, January, 1926.

(5) **Ling's** case was that of a boy, aged 16 years. When the lids were drawn apart in the region of the right external canthus, it was found that their ends were separated from one another by a semilunar fold of skin about 5 mm. long. Immediately external

to this, was an oblique opening in the skin from which lacrymal secretion was dripping. A probe could be passed up this opening for a distance of 8 mm. to the lacrymal gland. Some 10 mm. of the duct were excised under local anaesthesia and the duct was found to be connected with the orbital portion of the lacrymal gland. Complete cure ensued. An interesting point is, that there was no subjective sensation of dryness in the affected eye.

F. A. WILLIAMSON-NOBLE.

II.—THE CORNEA

(1) **Majewski, K. W. (Cracow).—A new method of keratoplasty with perforation of the cornea. (Nouveau procédé de kératoplastie pénétrante.)** *Arch. d'Ophtal.*, February, 1925.

(1) **Majewski** has written a very interesting paper (designated a "preliminary communication") in which, in addition to or rather as an introduction to his description of the method of transplantation of a disc of cornea, which he has employed experimentally and which he is still investigating, he gives a brief but valuable résumé of earlier work on this subject.

A century has passed since the idea of transplanting corneal tissue was evolved: it is doubtful to whom priority is due. In 1824, Reisinger, Himly, and Riecke experimented on animals. No encouraging results were obtained and the idea seems to have been forgotten until 1872. In that year it was resuscitated by Power, and in 1877 von Hippel described his method which has since become classic. During the years 1910-16 the important work of Magitot appeared in the *Annales d'Oculistique*. According to von Hippel there are two chief methods: (*a*) partial or superficial keratoplasty in which the corneal graft is implanted in a circular excavation cut in the anterior layers of the cornea; and (*b*) complete or penetrating keratoplasty: in this procedure the trephine cuts through the whole thickness of the cornea and in this opening a disc of healthy cornea is inserted. The first method is the easier and is attended by less danger. The difficulties and risks of the second method are such that in manuals on operative technique it is wholly omitted (Poulard), merely mentioned (Römer), or actually discouraged (Terrien). In Elschnig's clinique an attempt has been made to resuscitate this procedure and the last edition of Graefe-Saemisch contains a detailed description thereof.

Majewski's description of the method devised by him is, briefly, as follows: The eye is atropinized and a local anaesthetic applied. With a hand-trephine (*i.e.*, without clockwork) of 4 mm., the

centre of the opaque cornea is trephined to a depth of, approximately three-quarters of its thickness. A metal sleeve on the trephine, which can be set as desired, prevents the penetration of the cutting edge beyond a given depth. This portion of the cornea is then removed with a narrow knife, leaving a thin posterior layer. At this stage the speculum is withdrawn and the eye covered with moistened gauze.

From the cornea of a healthy eye a graft is cut with a 4 mm. trephine through the whole thickness of the cornea. (Majewski adopts a special procedure for this purpose the description of which should be studied by anyone proposing to follow his method.) The graft is placed in warm normal saline solution.

Returning to the eye on which the "preparatory keratectomy" has been done a trephine of 3.5 mm. is taken and the posterior layers of the cornea at the bottom of the first-made trephine wound are cut through. The result is an excavation 4 mm. in diameter through the greater part of the cornea and an aperture into the anterior chamber 3.5 mm. across. Round the posterior part of the larger aperture is a thin ledge of corneal tissue 0.5 mm. in width. The graft is implanted in the trephine aperture using nothing but a spatula to place it in position: being 4 mm. in diameter it rests on the 0.5 mm. of corneal tissue at the bottom of the trephine wound and if the leucomatous cornea is not thicker than the sound cornea, the graft protrudes slightly above the surrounding surface. After careful lavage of the eye, atropin is instilled and a bandage applied over both eyes for twenty-four hours. At the end of this interval the graft is intimately adherent to the edges of the aperture; after two to three days it will be evident that the graft has "taken." There is some ciliary injection but usually no lacrymation or photophobia. More or less vascularity of the leucoma develops but stops at the edge of the graft.

These are in brief the methods adopted experimentally by Majewski. He has much to say concerning them and concerning the chances of success in transplantation of cornea by any method. An abstract of his remarks would not do him justice; they are of interest and should be read in the original.

J. B. LAWFORD.

(2) **Koppanyi, Theodore, and Byfield, Albert H.—A successful corneal transplant using mesentery.** *Amer. Jl. of Ophthal.*, January, 1926.

(2) **Koppanyi** and **Byfield** give a short report of an experiment on the cornea of a rabbit. A vertical strip of cornea 3 mm. wide was dissected up over the centre of a rabbit's cornea, extending from the upper to the lower margin thereof. A strip of mesentery from another rabbit was used to cover the defect, the upper and

lower ends being stitched with silk to denuded areas of the sclera. The lids were sutured for four days. On freeing them, the graft was found to be in good position with very little clouding, and in the ensuing weeks, there was a gradual increase in the clearness of the transplant.

F. A. WILLIAMSON-NOBLE.

(3) **Néchitch, G. (Belgrade). — Treatment of rodent ulcer (Mooren) of the cornea by the method of fistula production (La méthode fistulisante dans le traitement de l'ulcère rongeant de la cornée.)** *Ann. d'Ocul.*, Vol. CLXIII, p. 264, 1926.

(3) Mooren's ulcer appears in middle-aged debilitated patients as a rule. It is of semilunar shape, starting near the limbus. Rarely it starts between the limbus and the centre of the cornea and exceptionally in an annular form leaving a central island of cornea. Perforation is extremely rare, but the ulcer destroys from one-half to two-thirds of the thickness of the substantia propria. The ulcer is generally unilateral. When both eyes are affected the condition is more severe. The typical ulcer shows three zones; the edge advancing towards the centre which is grey, infiltrated, undermined; a peripheral healing portion; and an intermediate zone which is the most advanced. Almost innumerable varieties of treatment have been adopted. These are listed on page 266. Some of these methods have yielded satisfactory results according to **Néchitch.** Epalza is quoted (*Klin. Monatsbl. f. Augenheilk.*, LIV, p. 266, 1915) as having had a case of Mooren's ulcer, infected with the diplobacillus, with marked conjunctivitis and infiltration of the corneal ulcer. Perforation of the ulcer ensued, and after this occurrence, rapid healing took place. Although Epalza concluded that the infection was the most powerful element in leading to recovery, Néchitch regarded the perforation as the cause of the improvement. The method adopted by Néchitch (detailed in *Zeitschr. f. Augenheilk.*, XXV, H. 6) consists in paracentesis through the ulcer with a keratome. A spatula is then placed beneath the ulcer to isolate the latter. The ulcer is cauterized by the galvano-cautery, piece by piece, down to the spatula, and the breach is enlarged as far as is considered necessary. Large fistulae so made do not close for ten days or even more. All this time the anterior chamber remains empty and the cornea is placed in the most satisfactory condition for its circulation and nutrition. Néchitch reports three cases:

Case 1.—Male, aged 52 years, agricultural labourer. History of three and a half months' discomfort in the left eye. July 15, 1918, L.V. 0.9. Out-patient till September 24. The ulcer had widened 1 mm. towards the centre and also towards the limbus.

On July 7, it measured 4.5 × 7 mm. November 20, the ulcer had extended in spite of various forms of treatment; cauterization of the floor and margin of the ulcer, followed by the formation of a fistula as described, of the most infiltrated part was carried out. The only other treatment that was adopted consisted in the use of atropin, poultice, and argyrol ointment, applied warm. The eye was bandaged with slight pressure. Three times daily and once nightly at first, the eye was dressed, care being taken not to close up the fistula. December 10, anterior chamber partly filled for the first time. The cork or plug of new tissue closing the fistula was raised by forceps and spatula. December 19, ulcer healed over the main part. Fistula closed and not reopened. Anterior chamber full. December 27, upper part of cornea showed elliptical leucoma adherens 5 × 4 mm. January 20, L.V. 0.4 Patient discharged cured.

Case II.—Female, aged 42 years. Both eyes affected for duration of two months before admission to hospital, March 2, 1921. Right ulcer 6 × 3 mm. at 11 o'clock, left ulcer 4 mm. along the limbus about 1 o'clock. April 8, 1921, conjunctival flaps sutured to cover cornea. April 14, 1921, in both eyes, pain, swelling of flaps; the sutures were removed, purulent infiltration of ulcers, hypopyon 1 mm. in right. Both ulcers were thoroughly cauterized and a fistula made near the border, and iridectomy made in the right. May 7, 1921, R.V. 0.3, L.V. 0.6. R. and L. leucoma adherens. Patient discharged cured.

Case III.—Female, aged 38 years. March 6, 1924, left affected two weeks. By April 12, 1924, the ulcer was 8 × 5 mm., not semilunar in shape but convex towards the centre of the cornea, having widened in this direction by 2 mm. Fistula made with a breach of 2 mm. cylindrical in shape, by means of the cautery. May 8, 1924, L.V. 0.8. April 9, 1924 discharged cured.

This form of treatment is recommended by Néchitch in all cases in which other methods of treatment appear inefficacious. The most important factor, he contends, is that the anterior chamber should remain open as long as possible. It is believed that the low ocular tension is mainly responsible for the recovery.

HUMPHREY NEAME.

(4) **Mylius, K.—Corneal opacities caused by holocain. (Über die holocaintrübung der cornea.)** *Zeitschr. f. Augenheilk.*, p. 133, March, 1925.

(4) **Mylius** has studied the peculiar milky opacity which appears on an abraded cornea after the instillation of holocain. He attributes it to the formation of a free amine-base by the reaction of alkali on this drug.

With an intact corneal epithelium the alkali in the tears sets

free this base producing a slight opalescence which can be made out in the fluids of the conjunctival sac if carefully looked for: with a denuded epithelium the neutral holocain combines with the alkali in the corneal substance (estimated as 9.1 per cent. Na_2CO_3), and forms a definite milky incrustation therein. These changes may be prevented by the instillation of an acid so weak as to have no destructive effect on the tissues—0.5 per cent. acetic acid is suggested. Without the precaution of its use Mylius considers the use of holocain unjustified, especially in the presence of an abrasion.

W. S. DUKE-ELDER.

(5) **Young, Charles A., M.D. (Roanoke, Va.) Electro-thermophore in treatment of corneal ulcers.** *Amer. Jl. of Ophthal.*, pp. 293-300, April, 1925.

(5) **Young's** paper opens with descriptions of various types of thermophores, the model he favours being that described by Shahan in the *Journal of the American Medical Association* for June 30, 1917. It consists essentially of an electrically warmed brass tube with a thermometer and arrangements for regulating the temperature. Various types of applicators can be attached to it. Shahan's investigations on animals with regard to the effect of heat on the cornea have given the following results: 120°F. for ten minutes removed the epithelium; 128.40°F. for ten minutes slight clouding of substantia propria clearing up in seventeen days; 128°F. opposite the iris, for ten minutes, atrophy of subjacent iris noticeable in about two weeks; 152°F. for one minute, complete destruction of epithelium which regenerated in four days, also deep clouding of the cornea which slowly absorbed; 170°F. for one minute, no necrotic changes in the cornea. The author's technique was as follows: five instillations were made of butyn 2 per cent. and adrenalin 1:2,000 at minute intervals. The thermophore was set to the desired temperature (145°—160°F. depending on the virulence of the infection) and the applicator fitted. A speculum was inserted, the conjunctiva grasped with fixation forceps and the applicator of the thermophore applied directly and somewhat firmly to the diseased area for 45—60 seconds. The diameter of the applicator should be 1 millimetre less than that of the ulcer to be treated. When the ulcer is large and has a definite, advancing, and undermined edge, it suffices to apply the instrument to this part only. To stop the progress of an ulcer, high temperatures are used, regression and absorption, however, are stimulated by low temperatures. In addition to thermophore treatment various other remedial measures were used, atropin, zinc sulphate, probing of canaliculi, rest in bed, catharsis, sweating, etc. The author's conclusions are: (1) The

instrument is practically a specific in the treatment of infected corneal ulcers. It relieves pain, stops progress of the ulcer and ensures the best possible results. In only a small percentage of cases is a second application required; (2) a temperature of 158-160°F. for one minute gives the best results in infected ulcers; (3) favourable results were also obtained in dendritic ulcers; (4) the relief of pain is especially noticeable.

F. A. WILLIAMSON-NOBLE.

(6) **Sallmann, L.—Affection of the cornea due to the therapeutic use of copper. (Ueber Hornhautverkupferung nach therapeutischer Anwendung von Kupferprapäraten).** *Zeitschr. f. Augenheilk.*, Vol. LVII, p. 373, November, 1925.

(6) **Sallmann** finds that the prolonged use of copper preparations, especially the sulphate used as a solid stick or in the form of ointment, produces in the cornea in 50 per cent. of cases changes which closely resemble the effects produced in the cornea by intraocular foreign bodies of this metal, described by Jess (*Klin. Monatsbl. f. Augenheilk.*, Vol. LXVIII, p. 433; Vol. LXIX, p. 218, 1922; *Ophth. Ges.*, Heidelberg, 1924).

The first signs appear after several months use of the copper, and are evident at the periphery of the cornea. Here an opacity is formed, the exact position and chemical nature of which have not been determined; probably it is due to the formation of a basic carbonate. There is no interference with vision, however, even in advanced cases, and negative results in animal experiments point to the view that the other structures of the eye remain unaffected by the copper. The appearance of the changes therefore is no indication for interrupting treatment with this metal, which is frequently neither easily nor satisfactorily replaced.

W. S. DUKE-ELDER.

(7) **Féjer, Dr. Julius (Budapest).—Inflammation of the cornea caused by solution of silver nitrate.** *Amer. Jl. of Ophthal.*, November, 1925.

(7) **Féjer** described a case where the use of 10 per cent. silver nitrate solution by a midwife, to prevent ophthalmia neonatorum, caused opacity of both corneae and permanent impairment of vision in one eye. He then notes that in Hungary, midwives are compelled to use 1 per cent. solution of silver acetate. The advantage of this salt is that at room temperature it is only soluble up to a strength of 1 per cent. and therefore it is impossible to obtain a stronger solution. Zweifel and Scipiades have shown that a 1 per cent. solution of the acetate is just as efficacious as a 2 per cent. solution of the nitrate while it causes less catarrh.

F. A. WILLIAMSON-NOBLE.

III.—MINERS' NYSTAGMUS

(1) **Pooley, G. H. (Sheffield).—A study of some aspects of miners' nystagmus.** *Lancet*, April 10, 1926.

(1) **Pooley,** in connection with his membership of the Miners' Nystagmus Research Committee of the Medical Research Council has taken the opportunity to go over the evidence which has been brought forward at two different periods, namely, the periods 1870 to 1907 and 1907 to the present time. The author discusses this evidence and gives a summary. This summary one may endeavour further to compress: (1) during the former period, in France, Belgium, and Great Britain the incidence was the same; (2) the incidence of incapacity was also the same and was slight and short; (3) since then, the claims for compensation for incapacity have increased all round, but more in proportion in Great Britain; (4) in America little is known of miners' nystagmus or of incapacity caused by it; (5) in Britain there is a wide divergence in the severity of the nystagmus for which compensation is claimed; (6) it is agreed by most observers that those miners are most affected who work in the poorest light and they attribute this to working in defective light; (7) Haldane declares that the incidence of carbon monoxide in coal mines is not greater than it is in many large towns where coal is being burnt. Moreover carbon monoxide is not a tissue poison except from its effect on haemoglobin.

The author holds that the increase in the incidence of claims for compensation and of the duration of such claims compared with 1870-1907 and compared with the continental claims at the present time, seems to be due to claims for incapacity not being decided by a few picked medical experts as on the continent. As a result confusion has arisen between a condition due to miners' nystagmus and a condition which is the result of a subconscious desire for unearned pecuniary gain which is also found in other claimants for compensation for injuries to eyes, etc. The cause of miners' nystagmus the author considers to be still unsettled, but the existing evidence is strongly in favour of its being a compensatory effort on the part of the central nervous system to overcome the effect of working in defective light.

Having reached these conclusions two factors particularly invited fresh investigation, namely (1) the behaviour of the eye under conditions of dark adaptation; (2) the incidence of nystagmus in different pits under different conditions.

The results of the first only of these investigations is here published. After a careful account of the special apparatus employed and of the experiments carried out with it the author gives some of his conclusions. These are: (1) that the centre of the macula is the most sensitive spot for form and colour vision

in bright light; (2) as the intensity of the light diminishes the central macular area becomes both absolutely and relatively less sensitive to form vision than the area at the periphery of the macula and the adjacent part of the retina; (3) the periphery of the retina appears to be relatively very insensitive to form vision no matter what the intensity of the illumination may be, or whether the eye be light or dark adapted; (4) the threshold point of illumination at which the central area begins to lose its supremacy is between 0.003 and 0.002 candle power. When the illumination is below 0.002 c.p. the scotoma is increasingly marked and the most sensitive part of the visual field is a signet ring shaped area surrounding the macula at about an angle of 2 degrees with an extension to 4 degrees at the temporal side; (5) the feebler the illumination the greater is the difficulty in maintaining strict fixation. The eye tends to travel in a small area all round the object it is fixing. This becomes exaggerated into something very like a vertical and even a rotatory nystagmus at times.

The article of which the foregoing is a brief and imperfect summary is one which seems to be of very considerable importance to those who have to deal with miners' nystagmus. There is no bibliography but the reader is referred for it to the first report of the Miners' Nystagmus Committee, and, on the subject of dark adaptation, to papers by Selig Hecht in the *Journal of General Physiology*.

ERNEST THOMSON.

(2) **Fergus, Freeland (Glasgow).—Miners' nystagmus.** *Glasgow Med. Jl.*, March, 1926.

(2) This article by **Fergus** is interesting as the expression of the views of an agnostic (the author's word) on the subject of miners' nystagmus, but it is entirely unsuited for lengthy abstraction and should be read in the original. In order, however, that readers may have an idea of the contents of the article it may be sufficient to say: (1) that Fergus's argument is "that miners' nystagmus is chiefly a disease of the nervous system due to some cause not yet discovered"; (2) that he rejects, after discussion of them, the theory of defective illumination, the theory of gas poisoning, and the posture theory; and (3) that he abandons his own previously expressed views in favour of the defective illumination theory. Fergus suggests that the disease be reinvestigated "from the biological point of view," and that to this end "the present nystagmus committee should be thanked and discharged." He continues, "I cannot help thinking that they have gone on wrong lines altogether. They have proposed a remedy which, to a great extent, has only made matters worse, and which has put the owners to great and useless expense." And he makes other

suggestions for a drastic overhaul of the whole subject. Miners' nystagmus, he says, "is in no special sense an ophthalmic disease, and further inquiries should be made along those lines of research which have proved so useful in unravelling the aetiological factors in many other diseases." There is an appendix to the paper in the form of a note by Professor W. K. Hunter of Glasgow, in which, after recounting certain arguments, he suggests that miners' nystagmus may be due to disturbance of the cerebellum or one of its afferent pathways.

ERNEST THOMSON.

(3) **Davies, J. Prosser (Cardiff).—Miners' nystagmus: a tentative theory.** *Lancet*, April 24, 1926.

(3) In a letter to the editor of the *Lancet* **Davies** suggests that functional disturbance of the labyrinth and cerebellum may be caused, to such an extent as to produce nystagmus, by the sudden vertical drop through space in the descent of the mine shaft. He states that in one of the collieries in his district a depth of 880 yards is reached in sixty seconds, "a virtual fall of the human body through space at the *middle* of the descent at the rate of about 35 miles per hour." Davies makes the plausible suggestion that since, in diseases of the labyrinth and cerebellum we get nystagmus and vertigo, that is sensations of uncontrollable abnormal movements, so when the movements are really abnormal we may get functional disturbance of the labyrinth and cerebellum.

ERNEST THOMSON.

BOOK NOTICES

Microscopische Anatomie der Regenbogenhaut. By M. WOLFRUM, Professor in Leipzig. Being part of **Graefe-Saemisch Handbuch der Gesamten Augenheilkunde.** Berlin: Julius Springer, 1926.

This beautifully illustrated account of the microscopic anatomy of the iris fills 218 pages, and is the most complete with which we are acquainted. Fifty pages are devoted to low-power magnification of the living eye, and thirty to the microscopic and topographical relations of individual parts. In these, variations in pigmentation, and the appearances of the corona, crypts, etc., with the slit-lamp, are exhaustively described. The technique of histological examination is discussed, special attention being directed to the avoidance of shrinking and artefacts. There are excellent photographs of the iris and filtration angle in the newborn, the child, the adult, and the monkey. Descriptions, with diagrams, of the angle in the gibbon, gorilla, a Hottentot, a Fellah, an Herero, and an executed criminal are given, and there

are four exquisite drawings of the angle demonstrating the ciliary end of the dilatator iridis and other features.

The remainder of the monograph is devoted to the finer histology of the iris. Particularly noteworthy here is the conclusion arrived at by Wolfrum that there is no continuous endothelial layer on the anterior surface of the human iris, though it is well marked in the cat and other lower animals. In man, the anterior surface of the iris is porous, the intercellular lymph spaces communicating directly with the anterior chamber in addition to the well-known crypts. The latter are shown to be absent in monkeys. The various structures composing the stroma—collagenous and elastic fibres, chromatophores and "tapetum" cells, Koganei's "clump" cells, vessels, etc.—are minutely discussed. Over fifty pages are devoted to the history of the much disputed dilatator and the histology of that muscle and the sphincter. This part also is beautifully illustrated. Finally, the pigment epithelium and the nerve supply of the iris receive due consideration.

This monograph, with its excellent bibliography, must long remain the indispensable authority on the subject.

Visual Field Studies. By RALPH I. LLOYD. New York: The Technical Press, 1926. Pp. 216. Price 6.00 dollars.

This book opens with a short account of the history of perimetry beginning with an article published in 1856 by von Graefe who used a simple blackboard, and among other things discovered the nasal step usually associated with the name of Roenne. The use of a stereoscope for mapping out central defects was suggested by Haitz in 1904. This instrument was improved by the author and now goes under the name of the Stereo-Campimeter. It would seem to be of great service and not sufficiently well known in this country. The author makes free use of records obtained by it and finds it of value in detecting small central colour scotomata and in estimating the size of the blind spot, etc. He also employs it for measuring the angle of deviation in cases of squint. This is done by locating the position of the blind spot of the deviating eye when the good eye is fixing and then when the deviating eye is fixing, and measuring on the chart the angular displacement between them. The result obtained may differ markedly from that found by the ordinary perimeter method. The author's opinion as to the aetiology of squint is "that strabismus is associated with pathology, and is not a non-use complex"—alternating squint being regarded as "exclusively cortical or nuclear abnormality." His principal arguments are: that the field of the deviating eye is usually 20° smaller than normal, the blind spot larger than normal, and that there is often a relative or absolute central defect for colours, and in extreme

cases for white. The pathological basis is thought to be the occurrence of birth haemorrhages at the macula, or haemorrhages into the optic nerve sheath which injure the macular nerve fibres. No mention is made of Worth's cases where excessively prolonged covering of the fixing eye—through inadvertence of the parents—resulted in its becoming amblyopic.

In the chapter on technique some useful hints are given on the use of the ordinary perimeter—for example, the object should always be in motion, since peripheral vision is adapted to the perception of moving objects, and the patient should be given a definite rest period between each two observations. There is an interesting account of the taking of peripheral colour fields. The numerous sources of fallacy lead the author to prefer Bjerrum's idea of using a series of graduated white objects.

After the chapters on technique, physiology and anatomy, there follows an account of various diseases of the eye, emphasis being laid on the field changes occurring in them. The author then passes on to describe retrobulbar disease, chiasm disease, tract disease and finally, lesions behind the thalamus and in the cortex.

While the book contains much that is interesting and even stimulating, it also contains a good deal of matter calling for criticism. For example, in discussing the mechanism of the production of papilloedema, it is stated "that the *sine qua non* of the swollen disc from brain tumour is a distension of the third ventricle, which is so located, that it presses on the chiasm from above." Such pressure is thought to be a cause of the intermittent blindness found in cases of cerebral tumour. For papilloedema to occur, however, there has to be some communication between the subdural spaces of the brain and optic nerve, so that the increase in subdural pressure in the former can be transmitted to the latter.

Again in discussing pituitary disease, the author entirely overlooks the significance of the group of cases where papilloedema is present on one side and optic atrophy on the other, by stating that "choked disc is not a feature of pituitary disease unless there is an added infection."

Inperfections of this kind, though irritating, do not entirely spoil the book for the experienced ophthalmologist though they would make one doubt the wisdom of advising a student to read it.

Cancer de l'Appareil Visuel. By V. MORAX, Ophthalmologist to the Lariboisière Hospital, Paris. With 4 coloured plates and 139 figures in the text. Pp. 503. Paris: Doin & Cie., 1926. Price 100 francs net.

Dr. Morax has written an excellent monograph on malignant disease of the eye, the eyelids, and the orbit. It forms a worthy sequel to the well-known treatise of Lagrange on the same subject,

and brings the bibliography up to date, though with some not unimportant omissions.

In addition to an admirable description of the commoner types of sarcoma and carcinoma, their clinical histories and features, it includes examples of many cases of rarer forms, such as, for example, primary carcinoma of the ciliary body. Most of the illustrations of histological details are from drawings which depict the structures very clearly.

The book can be confidently recommended as a sound guide to the subject, whilst the discussion of many illustrative cases which have come under Dr. Morax's own observation should secure for it a place in every ophthalmological library.

CORRESPONDENCE

THE STRUCTURE OF THE RETINA

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—Arising out of the abstract which appeared in your issue of April, p. 228, on the work of Dr. Fortin on entoptic vision and his description of a hitherto undescribed layer of the retina lying between the external fibre layer and the internal nuclear layer, he has been good enough to send to me two microphotographs of the macular region of the eye of the monkey with some further observations on his interpretation of them. The photographs are of a standard of excellence which may merit their publication: they were taken from the freshly enucleated eye of a healthy animal, and are largely free from the post-mortem changes which we are accustomed to meet in ordinary histological technique.

In each, at the top, the sclerotic, choroid, and pigmentary layer are lacking. Then appear, from above downwards, the layer of cones, the external limiting membrane, the external granular layer, and the external fibre layer with the fibres of Henle.

Dr. Fortin draws attention to the appearance of the foveal cones. They appear as simple fibres surrounded by a light cuff ("léger manchon"), and they pierce at definite intervals the external limiting membrane, which is invariably perfectly regular and sharply defined. The appearance of this membrane suggests a function comparable to the bridge of a violin, keeping the fibres taut, maintaining their individual position, and preventing them from intermingling. The appearance is maintained uninterruptedly

from its attachment on the one hand at the disc to its attachment peripherally at the ciliary body, and Fortin thinks that the movements of accommodation, convergence, etc., by rendering it lax at one moment and taut at another, and thus altering the spacing of the elements supported by it in so doing, account for the phenomena of macropsia and micropsia.

In the external fibre layer the individual fibres are perfectly isolated and regularly orientated, radiating always from the central axis of the eye; at their termination, between this layer and the

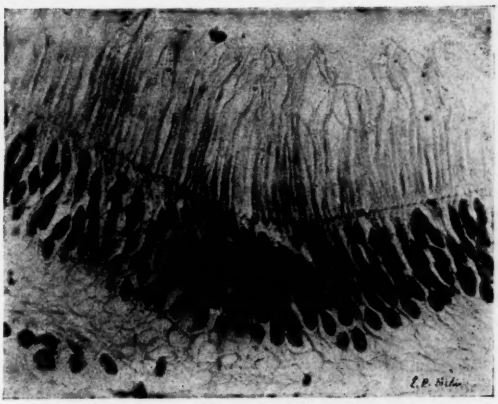

FIG. 1.

Fovea of Monkey.—The sclerotic, choroid, and pigmentary layer are not reproduced. The central cones appear as long filaments. Note the admirable definition of the fine external limiting line like the bridge of an instrument isolating the strings.

internal nuclear layer, lies the single line of cell-shaped structures which he has demonstrated entoptoscopically and has photographed histologically by the aid of monochromatic light (*vide* Abstract). Dr. Fortin does not agree that at the foveal region there is a zone of homogeneous and equally formed elements arranged in mosaic, which represents the area of retinal fixation and the region of maximal visual acuity. Anatomically all the retinal elements are centred round the optical axis of the eye, and physiological observations show that, in his opinion, fixation is attained not by a group of cones, but by a single cone. Moreover, he insists that the limiting angle of visual acuity is smaller than has usually been accepted, and is certainly not of a size which corresponds to the distance between two cones at the fovea, but is about ten times smaller, a finding which he takes as verified by the phenomena of stereoscopic vision and the entoptic vision

of the red blood corpuscles in the perifoveal capillaries. A cone is therefore too large to function as the ultimate element in the visual apparatus. The arrangement of the fibres of Henle, and

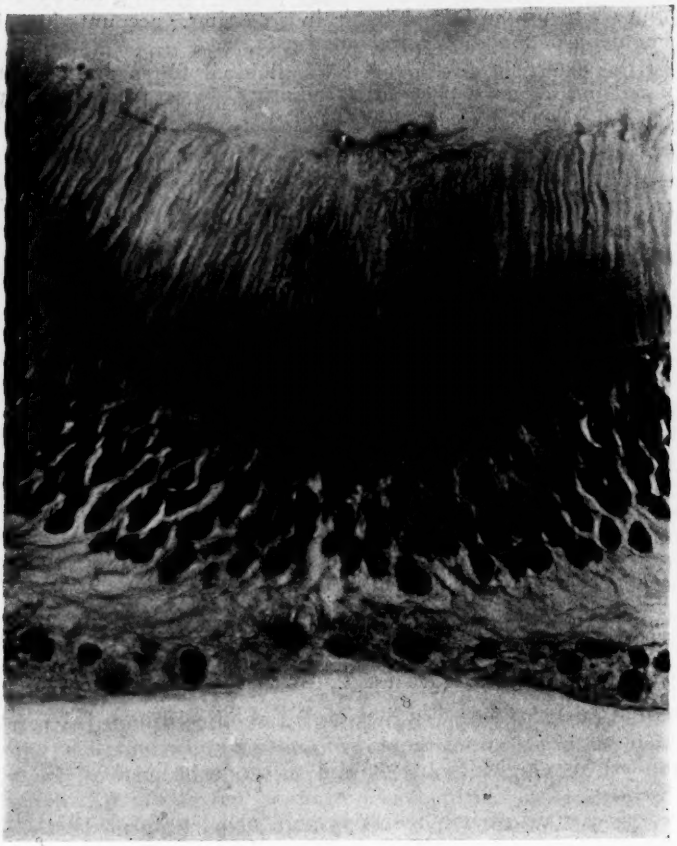

FIG. 2.

Fovea of Monkey.—The long central cones in no way resemble cones but are simply long filaments. The external limiting membrane is a geometrical line sharply defined.

the measurement of their diameter, which is of the order of the wave-length of visible light, suggests to him that these structures play a hitherto unsuspected part in the perceptive mechanism, and he attributes to them an "undulatory function" in resonance with the waves of light; these then react upon the "new" structures

situated in a regular layer at their termination, to which latter he ascribes the fundamental rôle in the process of visual perception.

The above seems to be an inadequate sketch of Dr. Fortin's argument as I translate it; we shall look forward to hear more of it in the future. Whatever the ultimate value of his observations and of the interpretation he attaches to them may prove to be, they are not without interest both for themselves and for the demonstration they provide that minute anatomy is by no means a completed science. It is interesting to speculate how far from the actual truth are the artificial pictures of fixed and stained cells we pronounce upon with so much assurance in our crude methods of histology, and how far our ideas would be revolutionized, especially in dealing with structures of the delicacy and complexity of the retina, were we to evolve less mutilating methods of technique, and employ invisible light of wave-length so short as to be partially opaque to unstained protoplasm, rendered visible by a process of ultra-violet photography, or made apparent through the medium of fluorescence.

Yours, etc.,

W. S. DUKE-ELDER.

LONDON, W.
July, 1926.

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—I have the honour to make some remarks about the letter of Dr. MacCallan in the July issue of your journal, page 415, who wrote the following about my article:

"The article 'Trachoma in Palestine,' which appears in your May issue refers to the stages of trachoma without stating the origin of this classification."

The classification of the stages of Trachoma in Palestine has its short history. There was no uniform classification of the stages till 1914; only in the spring of the same year was there worked out at the First Trachoma Conference of the Jewish physicians in Palestine a uniform scheme of different stages and, as the basis, Professor Hirschberg's classification of trachoma was accepted.

Mild, Medium, Severe, and Terminated. But afterwards it was decided at the Conference of the eye physicians of the Hadassah Medical Organization, which took place in Jerusalem on November 3, 1921, and at which I was also present, to simplify Professor Hirschberg's classification in the form I stated in my article on page 252, where our

Stage 1 corresponds to Hirschberg's "Mild Trachoma."
Stage II " " "Medium Trachoma."

Hirschberg's "Severe Trachoma" was divided in such a manner that all complications of the cornea and eyelids were shown in separate columns, and the third stage was recognized by hypertrophic scars of the conjunctiva. Our stage IV corresponds to Hirschberg's "Terminated Trachoma."

Thus Dr. MacCallan can see, that the origin of the classification of the stages of trachoma, pointed out in my article, refers to the Work of Professor Hirschberg, published in 1897, under the heading: Uber die körnige Augenentzündung in Ost und West Preussen und ihre Bekämpfung."

At the same time I wish to point out that I am in possession of the very interesting Annual Reports of the Ophthalmic Section, signed by the Director of the Ophthalmic Hospitals, Dr. MacCallan, and not a long time ago I was glad to use from those reports the figures of the bacteriological examination of the conjunctiva for my article: "Les maladies des yeux à Caiffa." *Annales d'Oculistique*, Décembre, 1924.

Yours faithfully,

N. T. SHIMKIN,

Chief Ophthalmologist of Hadassah Medical Organization, Haifa, Palestine.

HAIFA.

July 14, 1926.

NOTES

Death

WE regret to hear of the death of Dr. Alexander Duane of New York. We hope to publish an obituary notice at a later date.

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Appointments

THE following appointments have been made recently at St. George's Hospital, London:—Consulting Ophthalmic Surgeon, Mr. HAROLD GRIMSDALE; Ophthalmic Surgeon, Mr. R. R. JAMES; Assistant Ophthalmic Surgeon, Mr. W. STEWART DUKE-ELDER.

MR. W. CLARK SOUTER has been appointed ophthalmic surgeon to the Aberdeen Royal Infirmary.

MR. G. P. PENMAN, has been appointed second ophthalmic surgeon to the Royal Northern Hospital, London.